

Q. Why is the relationship between soils, water and pesticides important?

A. Understanding this relationship can help prevent contamination of ground and surface water from pesticides. Pesticides and their properties, soil types, and conditions at the treatment site, affect the rate that pesticide-laden water either travels through the soil as leachate to groundwater or runs off impervious surfaces at the site to surface water. Following is more information about these crucial relationships.

Selecting and Applying Pesticides

- Pesticide applications have the potential to contaminate water resources, so it is essential to select pesticides or application methods carefully.
- Surface and subsurface applications have the greatest contamination potential.
- Before choosing a pesticide, review the product label for ground and surface water advisories.

Important Pesticide Properties

- How easily a pesticide dissolves in water (solubility);
- Whether pesticides stick to soil particles (adsorption) instead of traveling through the soil to groundwater;
- How quickly a pesticide evaporates (volatility) when applied;
- How quickly a pesticide is broken down by soil microbes (degradation).

Important Soil Properties

- How much organic matter there is in the soil to retain pesticides and water;
- Whether air spaces and worm holes exist, which would allow rapid flow through the soil;
- Whether soil texture is sandy or contains clay;
- How quickly water can pass through the soil;
- How saturated the soils are when applying pesticides.

Important Site Conditions

Several conditions influence which application techniques should be used to prevent pesticides leaching to groundwater, running off to surface water, or drifting out of the targeted area. Be aware of:

- The best time to apply a pesticide;
- Locations of water bodies and all wells;
- Depth of the water table;
- Soil type and slope of the land;
- Current and forecast weather conditions;
- Subsurface geology.

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Pesticide Application and Water Quality

Water is a vital resource for all life. It is vulnerable to contamination by pesticides. This brochure provides information for pesticide applicators, who have the responsibility to protect water quality through:

- Understanding the relationship between soils, water and pesticides;
- Learning how to properly apply pesticides to protect water resources; and,
- Using best management practices at all times.

Printing of this brochure was funded by the US Environmental Protection Agency through a FIFRA discretionary grant. Costs associated with this publication are available from the Idaho State Department of Agriculture in accordance with Section 60-202, Idaho Code.
HB366: 01/05/1/200/33402-EPAGWT53

Water, Sand, and Clay

Sandy soils have less organic matter and large particles of soil. They therefore are less able to hold water in the soil, allowing pesticides and water to travel quickly through to groundwater. On the other hand, clay soils hold water longer, and can readily form surface puddles of pesticides. This can lead to runoff to water bodies.



Sand



Clay

Q. How can one learn to properly apply pesticides?

A. There are several ways:

- *Read and follow the pesticide label.* The law requires that the directions of the pesticide product labels be followed. Labels provide valuable information on potential environmental hazards, including any use restrictions related to water resources. Labels can also help applicators choose the:

- pesticide which best controls target pests;
- pesticide least harmful to aquatic organisms; and,
- application methods to keep the pesticide within the area to be treated and away from water resources.

- *Seek pesticide applicator training courses.*
- *Read pesticide applicator training manuals.*
- *Consult the Idaho State Department of Agriculture (ISDA) or local specialists on soil properties.*



Q. What are the most important practices to follow?

A. All practices listed in the Idaho Pesticide Applicator Training Manual (ISDA Pub LS-001-99-R4) are important to use. The training manual is available at the Idaho State Department of Agriculture (ISDA) office.

Four primary water protection practices include the following:

1. Prevent or Minimize Drift and Runoff

- Avoid applying pesticides in weather conditions resulting in off target applications. Idaho Pesticide and Chemigation Law/Rule states the maximum wind speed is sustained 10 mph for application. Set the boom height as close as possible to the target.
- Select the correct pesticide formulation for the type of application to be made, given site and soil conditions, to avoid leaching to groundwater or runoff to surface water.
- Be aware of applications next to impervious surfaces or paved areas, such as sidewalks and roads. These can result in pesticides carried by runoff to surface water.
- Avoid leaving puddles of pesticides as they may leach to groundwater or run off to surface water.
- Check for buffers between field crops and surface water which can intercept runoff and prevent it from traveling to waterways.
- Use spot applications rather than broadcast applications when applicable.

2. Calibrate Often and Use Correct Nozzles

- Calibrate application equipment; it is an important first step in minimizing risk of contaminating water resources.
- Check calibration frequently to ensure pesticides are delivered at the proper rate.
- Use the right nozzle for the job, and replace nozzles that are too small, too large or worn.
- Operate nozzles at the appropriate pressure.
- Be aware that unnecessarily high pressure increases nozzle wear and the possibility of pesticide drift.

3. Prevent Spills and Back-Siphoning

- Avoid mixing and loading pesticides near wells and other water sources.
- Clean up pesticide spills immediately.
- Use approved anti-pollution devices on all chemigation equipment.

4. Dispose of Pesticides and Containers Properly

- It is illegal to dispose of pesticides improperly.
- Choose the best method of disposal that protects people and the environment, by:
 - Following the product label instructions for pesticide and container disposal;
 - Triple-rinsing containers holding liquid formulation, puncturing the top and bottom, and crushing flat;
 - Recycling pesticide containers; and,
 - Never burying pesticide containers, as residues in the containers may contaminate water resources.



The ISDA conducts pesticide disposal collections throughout Idaho to assist with the disposal of unusable pesticides. The Pesticide Disposal Program (PDP) was initiated to provide an environmentally conscious method to dispose of expired or otherwise unusable pesticides. Collections are held annually in every region of the state. Schedules and more information are available at the website <http://www.agri.idaho.gov/agresource/pdp2.htm>.

The ISDA is a co-sponsor of the Container Recycling Operation (CROP), which is a free program to chip and recycle pesticide or fertilizer plastic containers. All plastic pesticide containers up to 55 gallon drums can be recycled. For more information on this program, please visit the website at <http://www.idahoag.us>.

